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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,112	02/16/2001	Hideya Takeo	Q61207	3865

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EXAMINER	
PATEL, SHEFALI D	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/784,112	TAKEO, HIDEYA	
	Examiner	Art Unit	
	Shefali D. Patel	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 15-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 15-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment was received on May 16, 2005.

2. Claims 20-23 are newly added. Claims 9-14 have been cancelled.

3. Claims 1-8 and 15-23 are pending in this application.

Response to Arguments

4. Applicant's arguments filed on May 16, 2005 (Remarks on pages 6-8) have been fully considered but they are not persuasive.

Applicant argue on page 7 stating:

> Wang merely discloses the detection of abnormalities and makes no determination as to whether the detected abnormalities are malignant tumors or not. Col. 5, line 59 - col. 6, line 27', and col. 7, lines 47-52.

The examiner disagrees. As mentioned in the previous office action, this is explained by "Wang in column 5, line 59 to column 6, line 27 and in column 7, lines 47-52. Wang explain that the probability values, corresponding to the parameter used for distinguishing the suspected anomalous shadow from a normal shadow, are displayed in connection with the x-y coordinate information 55, corresponding to the one or more standard parameters concerning the suspected anomalous shadow, as part of the annotated map of detected abnormalities. Wang explain that the abnormal detections are selected by comparing the probability values with a probability threshold, corresponding to judging whether a probability that a shadow detected according to the prescribed detection process is a malignant tumor is high."

Further, Wang explains at col. 6 lines 1-27 and col. 8 lines 10 to col. 9 lines 1-7 that the marker's relative probability threshold is plotted against the detection rate as seen in Figure 3. Wang further explains the probability of the abnormalities to determine the levels (i.e. according

to the rate) of cancers (see, col. 8 lines 30-48). By determining the probability, Wang determines whether the abnormalities are malignant or not.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-8, 15 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (US 6,266,435 B1).

Referring to **claim 1**,

i. Anomalous shadow detecting means for detecting a suspected anomalous shadow from image data descriptive of an inputted image according to a prescribed detection process is illustrated by Wang in figure 1 by the abnormal feature detection means 50. The abnormal feature detection means 50 detects abnormalities 55 from a digitized image 40.

ii. Image output means for outputting information including at least information identifying the detected suspected anomalous shadow is illustrated by Wang in figure 1 by the annotated map of detected abnormalities 55, which is output on a small TV monitor 200 or on a high resolution TV monitor 400 or on a printout film 500. The information identifying the detected suspected anomalous shadow corresponds to the location information of the detected suspected abnormalities determined by the abnormal feature extraction sub-stage 51, as explained by Wang in column 5, lines 46-48.

iii. The image output means further outputting values of one or more standard parameters concerning the suspected anomalous shadow together with the information including at least the

information identifying the suspected anomalous shadow, wherein each of the one or more standard parameters is a parameter used for distinguishing the suspected anomalous shadow from a normal shadow, and the anomalous shadow detecting means detecting the suspected anomalous shadow by judging whether a probability that a shadow detected according to the prescribed detection process is a malignant tumor is high is explained by Wang in column 5, line 59 to column 6, line 27 and in column 7, lines 47-52. Wang explain that the probability values, corresponding to the parameter used for distinguishing the suspected anomalous shadow from a normal shadow, are displayed in connection with the x-y coordinate information 55, corresponding to the one or more standard parameters concerning the suspected anomalous shadow, as part of the annotated map of detected abnormalities. Wang explain that the abnormal detections are selected by comparing the probability values with a probability threshold, corresponding to judging whether a probability that a shadow detected according to the prescribed detection process is a malignant tumor is high.

Referring to **claim 2**, the image output means being either an image display means or printing means is illustrated by Wang in figure 1 by the small TV monitor 200 or high resolution TV monitor 400 or printout film 500.

Referring to **claim 3**, the image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow corresponds to claim 1iii, wherein the probability value corresponds to the certainty of detection of the suspected anomalous shadow and the x-y coordinate information corresponds to the information identifying the suspected anomalous shadow.

Referring to **claim 4**, this claim corresponds to claim 2.

Referring to **claim 5**, one or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow is explained by Wang in column 5, lines 48-50. The standard parameter is explained to be the probability that a shadow is abnormal, which corresponds to the malignancy/benignancy of a suspected anomalous shadow.

Referring to **claim 6**, this claim corresponds to claim 2.

Referring to **claim 7**,

i. One or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow corresponds to claim 5.

ii. The image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow corresponds to claim 3.

Referring to claim 8, this claim corresponds to claim 2.

Referring to **claim 15**,

i. An anomalous shadow detecting means for detecting a suspected anomalous shadow from image data descriptive of an inputted image according to a prescribed detection process corresponds to claim 1i.

ii. An image output means for outputting information including at least information identifying the detected suspected anomalous shadow corresponds to claim 1ii.

iii. The image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow, and the anomalous shadow detecting means detecting the suspected anomalous shadow, and the anomalous shadow detecting means detecting the suspected anomalous shadow by judging whether a probability that a shadow detected according to the prescribed detection process is a malignant tumor is high corresponds to claim 3.

Referring to **claim 16**, this claim corresponds to claim 2.

Referring to **claim 17**, the information identifying the suspected anomalous shadow is either of an image of the suspected anomalous shadow or numerical data descriptive of a position, morphology or size of the suspected anomalous shadow is explained by Wang in column 5, lines 59-63, wherein the information identifying the suspected anomalous shadow is numerical data descriptive of a position of the suspected anomalous shadow (x-y coordinate).

Referring to **claim 18**, the anomalous shadow detecting means detecting the suspected anomalous shadow by judging whether the probability that the shadow detected according to the prescribed detection process is the malignant tumor is high, prior to the image output means outputting information including the at least information identifying the detected suspected anomalous shadow is explained by Wang in column 5, line 59 to column 6, line 9.

Referring to **claim 19**, this claim corresponds to claim 18.

Referring to **claim 20**, one or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output

value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow corresponds to claim 5.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,266,435 B1) in view of Takeo et al. (hereinafter, "Takeo") (US 6,014,474).

With regard to **claim 21** Wang discloses an anomalous shadow detection system as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Wang does not expressly disclose iris or morphology filter. Takeo discloses iris filter (iris filter 40, col. 51 lines 52-55, col. 52 lines 9-19 and lines 57-65) and morphology filter (col. 62 lines 45 to col. 63 lines 1-5). Wang and Takeo are combinable because they are from the same field of endeavor, i.e., Medical Image Processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Takeo with Wang. The motivation for doing so is to detect the tumor pattern from an image efficiently as disclosed by Takeo at col. 5 lines 51-53 and col. 11 lines 38-46. Therefore, it would have been obvious to combine Takeo with Wang to obtain the invention as specified in claim 21.

With regard to **claim 22** Takeo discloses iris filter (40, col. 51 lines 52-55) and the detecting means further conducting a shape analysis on geometric features at col. 5 lines 13-19.

With regard to **claim 23** Takeo discloses morphology filter (col. 62 lines 45 to col. 63 lines 1-5).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

BRZAKOVIC et al., "An Approach to Automated Detection of Tumors in Mammograms," IEEE, 1990, pp. 233-241

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D. Patel whose telephone number is 571-272-7396. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shefali D Patel
Examiner
Art Unit 2621

September 6, 2005